



CCIE Enterprise Infrastructure v1.0 Bootcamp

EIGRP



EIGRP

- + Core EIGRP Goals
 - + Establish routed IPv4 & IPv6 connectivity
- + First EIGRP consideration
 - + AS Mode vs. Named Mode

EIGRP AS Mode vs. Named Mode

- + What are differences between AS mode and Named mode?
- + Named mode supports new features that AS mode does not...
 - + Wide Metrics
 - + HMAC-SHA Authentication
 - + IP FRR
 - + Add-Path
 - + Route Tag Enhancements
 - + VRF Aware IPv6
- + AS Mode can be upgraded to Named Mode
 - + **eigrp upgrade-cli**
 - + E.g. AS mode is preconfigured but the question asks you to do HMAC authentication

Core EIGRP Workflow

- + Enable global EIGRP process
 - + **router eigrp NAME**
- + Define the AFI and AS
 - + **address-family ipv4 autonomous-system 1**
 - + **address-family ipv6 autonomous-system 1**
 - + **address-family ipv4 vrf ABC autonomous-system 2**
 - + **address-family ipv6 vrf ABC autonomous-system 2**
- + Enable the protocol at the link level
 - + **network...**

Core EIGRP Workflow (cont.)

- + Verify EIGRP is enabled
 - + **show ip[v6] eigrp interface**
- + Verify EIGRP adjacencies have formed
 - + **show ip[v6] eigrp neighbors**
- + How do we know neighbors are fully adjacent?
 - + “Q Cnt” is zero in **show ip eigrp neighbors**
- + Verify EIGRP routing information
 - + **show ip[v6] eigrp topology**
 - + **show ip[v6] route eigrp**
- + Verify IPv4/IPv6 reachability
 - + **ping, traceroute, telnet, etc.**

EIGRP Transport Considerations

- + EIGRP Multicast
 - + EIGRP uses protocol 88 to 224.0.0.10 to discover neighbors
 - + Implies transports such as DMVPN could be broken
 - + **ip nhrp map multicast...**
- + EIGRP Unicast
 - + Topology is synchronized as protocol 88 unicast
 - + Broken unicast means neighbors are discovered but routes aren't installed
 - + i.e. "Q Cnt" is stuck as non-zero

EIGRP Transport Considerations (cont.)

- + Can optionally use only unicast
 - + **neighbor** command specifies remote unicast neighbor
 - + Disables the processing of inbound EIGRP multicast on that link
 - + Implies neighbor command is required on both sides
- + EIGRP transport can be verified with...
 - + **debug eigrp packet...**
- + What else could break transport?
 - + Data Plane (ACL) filters
 - + Control Plane (CoPP) filters

EIGRP Adjacency Considerations

- + After transport is established, adjacency is negotiated
- + Options must match for adjacency, such as...
 - + Autonomous System
 - + Authentication
 - + Metric Weights (K Values)
 - + Transport Method
 - + E.g. unicast only
- + “Q Cnt” of zero indicates fully formed adjacency

EIGRP Authentication Considerations

- + Two supported modes
 - + MD5 in AS and Named Modes
 - + HMAC-SHA in Named Mode

» MD5

- References a Key Chain
- Multiple keys supported w/ Automatic key rotation
- Supports default Key Chain in named mode
 - af-interface default

» HMAC-SHA

- Named mode only
- Single key only
- Supports default key
 - af-interface default

EIGRP Topology Considerations

- + Once adjacency is established, routes are exchanged and DUAL is calculated
- + Like RIP, EIGRP is distance vector
 - + If received routes aren't installed they can't be advertised
 - + E.g. a lower AD route preempts the EIGRP route
 - + Result is that feasible distance is "inaccessible"

EIGRP Metric Considerations

- + Feasibility Condition (metric) is calculated as...
 - + Local Distance (LD) + Advertised Distance (AD) = Feasible Distance (FD)
 - + Lowest FD = Successor
 - + Path is Feasible Successor (FS) If $AD < FD$
- + Feasible Successors are used...
 - + For unequal cost load balancing if **variance** is configured
 - + As backup routes for the Successor
 - + As LFAs for the Successor if IP FRR is configured
 - + Switching from Successor to FS does not generate a QUERY

EIGRP Path Selection Considerations

- + EIGRP has two types of routes
 - + Internal & External
- + Internal EIGRP
 - + Uses Feasibility Condition end-to-end
 - + Administrative Distance 90
- + External EIGRP
 - + Uses Feasibility Condition to ASBR
 - + Administrative Distance 170
 - + Uses Router-ID as loop prevention
 - + Self router-id in path = don't install route

EIGRP Filtering Considerations

- + Since EIGRP is Distance Vector, filtering is supported anywhere
 - + Passive Interface
 - + Prefix-Lists
 - + Standard Access-Lists
 - + Extended Access-Lists
 - + Offset Lists
 - + Administrative Distance
 - + Per Neighbor AD
 - + Route Maps
 - + Enhanced Route Tags

EIGRP Scaling & Convergence Considerations

- + Filtering is used to enforce scaling hierarchy
 - + EIGRP Stub
 - + EIGRP Summaries
 - + Selective filtering with Stub Leak Map
 - + Selective summary path selection with Summary Metric
- + EIGRP natively supports LFAs
 - + Use BFD for fast neighbor detection
 - + Use FS and IP FRR to install LFAs

